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SPLIT

DART AEROSPACE LTD	Work Order:	19665A
Description: Aft Crosstube	Part Number:	D2890
Drawing: D2890 Rev. B; D6008 Rev. A	Qty:	6 <del>14</del>
Page 1 of 2		

Step	Location	Procedure	By	Date	Qty
1	DC	Issue Traveller <i>Dwg. not required RF 02.11.05</i>	<i>HJ</i>	03.09.19	14
2	PG	Issue P/O: <i>2005668</i> a) Extrude as per Dwg D6008 length = 180" (Ref. D6008-180) b) Material: 7075-T6/T6511 (WW-T-700/7 or QQ-A-225/9 or QQ-A-200/11) ) Seamless aluminum tube c) Minimum ultimate tensile strength = 77ksi d) Minimum tensile yield strength = 66ksi e) <b>Material certification required</b>	<i>U</i>	03-09-22	14
3	RG	Receive and inspect for transit damage <b>Ensure material certification attached</b>	<i>Q</i>	01-01-05	16
4	QC6	Inspect dimensions as per Dwg D6008 and check 180" length	<i>B</i>	01-01-13	16
5	FP	Acid etch and alodine as per QSI 005 4.1 Inside and outside of tube	<i>HJ</i>	04-01-13	16
6	LG	Bend as per Dwg D2890 and Folio FT002 <b>Sign Page 2</b>	<i>U</i>		
7	QC6	Inspect dimensions per Dwg D2890 <b>Sign Page 2</b>	<i>U</i>		
8	LG	Deburr and Polish <b>Sign Page 2</b>	<i>U</i>		
9	FP	Acid etch and alodine as per QSI 005 4.1 Inside and outside of tube <b>Sign Page 2</b>	<i>U</i>		
10	QC5	Inspect work to Step 9 <b>Sign Page 2</b>			
11	ST	Identify and stock	<i>U</i>	05.04.27	6
12	AC	Cost / part: <i>854.82</i>	<i>Syc</i>	05.04.28	6
13	DC	Close W/O <i>876.47</i> Inspect Level 21	<i>HJ</i>	05.04.29	6

Rev	Date	Change	Revised By	Approved
A	99.05.31	New Issue, ECN 200	DM	
B	00.04.11	Remove painting step	EC	
C	02.10.18	Re-format; Added spec	KJ RF	<i>QJ</i>

RELEASED  
02/10/30 RF

DART AEROSPACE LTD	Work Order:	19665
Description: Aft Crosstube	Part Number:	D2890
Drawing: D2890 Rev. B; D6008 Rev. A	Qty:	14
		Page 2 of 2

W/O Step	A	B	C	D	E	F	G	H	I	J	K	L
6		DP 04-11-18	DP 05-2-22	DP 05-2-23								
7		Er 04-11-18	FF 05-02-24	# 05-03-02								
8		DP BE 04-11-18										
9		PD MM 04-11-22										
10												

RELEASED  
02/10/30 RF



# Job Costing Report

Dart Aerospace Ltd.  
Hawkesbury

Sep 19, 2003  
01:10 pm

Work Order No : 0019665  
Project Name : D2890  
Project For : WK352  
Work Order Type : Main  
Main WO Number :  
House Part Number : D2890  
Description : Aft Crosstube  
Manufactured : Yes  
Amount Req'd : 14  
Amount Done : 0  
Start Date : 09-19-03  
Est Finish Date : 12-22-03  
Act Finish Date :  
Drawings Req'd : No  
Ok for Approval :  
Approval Rec'd :

Department Code:  
Burden Flags : NNNNNNNN  
WO Status : Open  
Invoice State : Not Invoiced  
Invoice Date :  
Invoice Number :  
Invoice Amount : 0.00  
Order Entry No :  
OE Value : 0.00  
Est Margin : 0.000%  
Actual Margin : 0.000%  
\$0 Posted to Finished Goods

	Estimated	Actual	Var. %	Posted	To Post
Material Cost :	0.00	0.00	0.00	0.00	0.00
Engineering Hours :	0.00	0.00	0.00		
Engineering Cost :	0.00	0.00	0.00	0.00	0.00
Production Hours :	0.00	0.00	0.00		
Production Cost :	0.00	0.00	0.00	0.00	0.00
Testing Hours :	0.00	0.00	0.00		
Testing Cost :	0.00	0.00	0.00	0.00	0.00
OverHead Hours :	0.00	0.00	0.00		
OverHead Cost :	0.00	0.00	0.00	0.00	0.00
SubContract Hours :	0.00	0.00	0.00		
SubContract :	0.00	0.00	0.00	0.00	0.00
Misc. Hours :	0.00	0.00	0.00		
Misc. :	0.00	0.00	0.00	0.00	0.00
Burden :	0.00	0.00	0.00		
Total Cost :	0.00	0.00	0.00		
Margin :	0.000	0.000			
Selling Cost :	0.00	0.00			

	Estimated	Actual
Labour Hrs/Amount Done :	0.00	0.00
Profits/(Loss) :	0.00	0.00

# Abnahmeprüfbescheinigung 3.1 B - EN 10204

Inspection Certificate 3.1 B - EN 10204 / Certificat de Reception 3.1 B - EN 10204

**Kunde:** Dart Aerospace Ltd.  
**Client:** 1270 Aberdeen Street  
 K6A1K7 Hawkesbury, ON Canada

**Zeugnisnummer:**  
 Cert No.: / No. du certificat: 2005668  
**Bestellnummer:**  
 Order No. / No. de commande: 2005668  
**Auftrag:** 6438/2  
 Our Reference/Notre Reference:

**Produkt:** Tubes seamless extruded  
**Product / Produit:**  
**Spezifikation:** QQA 200/11e, Tol. Acc to ASTM B 210  
**Specification:**

**Werkstoff:** 7075  
**Alloy/Alliage:**

**Zustand:** T 6511  
**Temper/État:**

**Abmessung:** 82,550 mm x 60,290 mm x 11,130 mm x 4572,00 mm  
**Size / Dimension:** Article D6008-180 3.250" x 0.438"

**Kennzeichnung:** Cert No.404/03-AWU-7075-T6511-Cast No.1049-QQA-200/11E-3.250" OD X0.438"Wall-Heat.No.2974-Lot6438-2-  
**Marking/Marquage:** 2P.O.-2005668

**Lieferung:** pcs. lbs  
 Delivered Material / Matériel délivré: 16 1146

## 1. Chemische Analyse

## Chemical Analysis / analyse chimique

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni
Charge/ min.			1,2		2,1	0,18	5,1						
Cast No. max.	0,40	0,50	2,0	0,30	2,9	0,28	6,1	0,20					
1049/03	0,124	0,239	1,361	0,057	2,372	0,192	5,683	0,037	0,004	0,0153	0,0001	0,0013	0,0030

**Hydrogen content:** 0,13 ccm/100 g Al

Elemente ohne Angabe < 0,01 % / Elements without indication < 0,01 %

## 2. Mechanische Eigenschaften

## Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (Rm) Ksi	yield (Rp0,2) Ksi	elongation 2" %	elongation A %	Hardness HB	
min.	77,0	66,0				
max.						
1	86,275	79,750	10,0		158	
2	86,710	80,620	10,0		154	

**Ergebnis der Prüfungen:** Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

**Test results:** We confirm that the delivery has been tested and applies to the agreements made on receipt of the order

**Resultats:** Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

**ALUnna****delivery note****7620**

page: 2  
date: 28.11.2003  
customer: 40980

Min. yield strength 66 ksi  
Tubes protected with corrosion protective oil  
Tubes line marked  
Packing list, Inspection certificate  
Packing: seaworthy wooden cases  
number of packages: 1  
number of pieces: 22

item	quantity	unit	net kgs
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002	16,000	PC	
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AWU article: 16539 / Customer article: D6008-180 3.250 x 0.438 x 180  
/Tariff no. 76082091

product: TUBES / seamless extruded / EN AW-7075 / round

condition: T 6511 / QQA 200/11E

outer diameter:	3,250 INCH Tol.	+0,016	-0,016
tol. for mean OD		+0,008	-0,008
inner diameter:	2,374 INCH		
wall thickness:	0,438 INCH Tol.	+0,043	-0,043
fixed length	180,000 INCH Tol.	+0,125	

test report acc. to EN 10204/3.1B / RM 531 / Rp0,2: 455

straightness 0,01 INCH / 1 FEET / RMS outer 25

tol. on quantity +10 % -10 %

3.250" OD 0.438" Wall, 180" lengths

Part Number D6008-180 crosstube

Surface Finish max. RMS 25

Tolerances per ASTM B210

Straightness 0.010" deviation /12" length

Outside surface: max. defects up to 0.005" (longitudinally)

Min. ultimate tensile strength 77 ksi

Min. yield strength 66 ksi

Tubes protected with corrosion protective oil

Tubes line marked

Packing list, Inspection certificate

Packing: seaworthy wooden cases

number of packages: 1

number of pieces: 16

Terms of payment: 30 days after date of delivery

terms of delivery: DDP (Delivered, Duty, Paid)

weight:	gross	1321,000	net	1028,000
Packstücke	2			



# delivery note

## 7620

page: 2  
date: 28.11.2003  
customer: 40980

Min. yield strength 66 ksi  
Tubes protected with corrosion protective oil  
Tubes line marked  
Packing list, Inspection certificate  
Packing: seaworthy wooden cases  
number of packages: 1  
number of pieces: 22

item	quantity	unit	net kgs
002	16,000	PC	

AWU article: 16539 / Customer article: D6008-180 3.250 x 0.438 x 180  
/Tariff no. 76082091

product: TUBES / seamless extruded / EN AW-7075 / round

condition: T 6511 / QQA 200/11E

outer diameter:	3,250 INCH Tol.	+0,016	-0,016
tol. for mean OD		+0,008	-0,008
inner diameter:	2,374 INCH		
wall thickness:	0,438 INCH Tol.	+0,043	-0,043
fixed length	180,000 INCH Tol.	+0,125	

test report acc. to EN 10204/3.1B / RM 531 / Rp0,2: 455

straightness 0,01 INCH / 1 FEET / RMS outer 25

tol. on quantity +10 % -10 %

3.250" OD 0.438" Wall, 180" lengths

Part Number D6008-180 crosstube

Surface Finish max. RMS 25

Tolerances per ASTM B210

Straightness 0.010" deviation /12" length

Outside surface: max. defects up to 0.005" (longitudinally)

Min. ultimate tensile strength 77 ksi

Min. yield strength 66 ksi

Tubes protected with corrosion protective oil

Tubes line marked

Packing list, Inspection certificate

Packing: seaworthy wooden cases

number of packages: 1

number of pieces: 16

Terms of payment: 30 days after date of delivery

terms of delivery: DDP(Delivered,Duty,Paid)

weight:	gross	1321,000	net	1028,000
Packstücke	2			



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SPL17

DART AEROSPACE LTD	Work Order:	19666
Description: Fwd Crosstube	Part Number:	D2889
Drawing: D2889 Rev. B; D6005 Rev. A	Qty:	2 14
		Page 1 of 2

Step	Location	Procedure	By	Date	Qty
1	DC	Issue Traveller <i>Dwg. not required RF 02.11.05</i>	KA	03.09.19	19
2	PG	Issue P/O: <i>70050028</i> a) Extrude as per Dwg D6005 length = 180" (Ref. D6005-180) b) Material: 7075-T6/T6511 (WW-T-700/7 or QQ-A-225/9 or QQ-A-200/11) Seamless aluminum tube c) Minimum ultimate tensile strength = 77ksi d) Minimum tensile yield strength = 66ksi e) <b>Material certification required</b>		03.09.22	19
3	RG	Receive and inspect for transit damage <b>Ensure material certification attached</b>	Q	04-01-05	22
4	QC6	Inspect dimensions as per Dwg D6005 and check 180" length	AB	04-02-11	22 PTO
5	FP	Acid etch and alodine as per QSI 005 4.1 Inside and outside of tube	2	04-02-11	22
6	LG	Bend as per Dwg D2889 and Folio FT001 <b>Sign Page 2</b>	DP	04-11-22	2 RTO
7	QC6	Inspect dimensions per Dwg D2889 <b>Sign Page 2</b>			
8	LG	Deburr and Polish <b>Sign Page 2</b>	DP	04-11-22	2
9	FP	Acid etch and alodine as per QSI 005 4.1 Inside and outside of tube <b>Sign Page 2</b>	DP	04-11-22	2
10	QC5	Inspect work to Step 9 <b>Sign Page 2</b>			
11	ST	Identify and stock	DP	04-11-22	2
12	AC	Cost / part: <i>582.89</i>	545	05.01.31	2
13	DC	Close W/O <i>582.89</i> Inspect Level 21	KA	05.04.29	2

Rev	Date	Change	Revised By	Approved
A	99.05.31	New Issue, ECN 200	DM	
B	00.04.11	Remove Painting step	EC	
C	02.10.18	Re-format; Added spec	KJ	KA

Step 10 - DS

RELEASED  
02/10/30 RFNCR  
DS/ED & DP.



DART AEROSPACE LTD	Work Order:	19666
Description: Fwd Crosstube	Part Number:	D2889
Drawing: D2889 Rev. B; D6005 Rev. A	Qty:	19
		Page 2 of 2

W/O Step	A	B	C	D	E	F	G	H	I	J	K	L
6	04.05.11	OP	OP	DP	DP							
7	04.05.11	#	#	DP	DP							
8				DP	DP							
9				DP	DP							
10				DP	DP							

1 7

Save ED for D205-596-101  
 SPAN is 119.125" angles 57°, 57°

RELEASED  
 02/10/30 RE